CLAIMS

What is claimed is:

1. A method of providing an electrical pulse to drive a discharge chamber of a laser system, the method comprising:

storing a voltage on a primary storage capacitor;

applying the voltage from the primary storage capacitor to a step up transformer;

outputting a stepped up voltage from the step up transformer in response to the applied voltage;

applying the stepped up voltage to a first capacitor and to a second capacitor, wherein the first capacitor and the second capacitor are in parallel to each other relative to the step up transformer, wherein in response to the applied stepped up voltage the first capacitor and the second capacitor store the stepped up voltage;

reversing a polarity of the stepped up voltage stored in the first capacitor; and

applying the reversed polarity stepped up voltage on the first capacitor and the stepped up voltage on the second capacitor in series across electrodes of the discharge chamber, whereby a total voltage applied across the electrodes is approximately twice the stepped up voltage.

2. A method according to claim 1, wherein:

reversing the polarity of the stepped up voltage in the first capacitor includes discharging the stepped up voltage through a winding of the step up transformer.

3. A method according to claim 1, wherein:

reversing the polarity of the stepped up voltage in the first capacitor includes discharging the stepped up voltage through a magnetic compressor placed across the first capacitor.

4. A method according to claim 1, further comprising:

cooling said first and second capacitors with at least one fan.

5. A method according to claim 1, further comprising:

using a solid state switch to trigger the application of the voltage from the primary storage capacitor to the step up transformer.

6. A method according to claim 1, further comprising:

providing a magnetic compressor across the first capacitor in order to reduce the amount of heat generated by the step up transformer.

7. A method according to claim 1, wherein:

applying the reversed polarity stepped up voltage on the first capacitor and the stepped up voltage on the second capacitor in series across electrodes of the discharge chamber further includes transmitting the reversed polarity stepped up voltage and stepped up voltage through a compressor inductor to the electrodes.

8. A method according to claim 7, further comprising:

using a reset control circuit to provide reset current to the compressor inductor.

9. A method according to claim 1, further comprising:

using at least one compressor stage to reduce the width of a voltage pulse applied to the electrodes.

10. A method according to claim 9, further comprising:

providing a path for a magnetizing current needed for the at least one compressor stage, the path including at least one inductor and a peaking capacitor.

11. A method according to claim 1, further comprising:

using a delay element to ensure a properly timed energizing of each of the electrodes.

12. A method of providing an electrical pulse to drive a discharge chamber of a laser system, the method comprising:

storing a voltage on a primary storage capacitor;

applying the voltage from the primary storage capacitor to a step up transformer;

outputting a stepped up voltage from the step up transformer in response to the applied voltage;

applying the stepped up voltage to a first capacitor and to a second capacitor, wherein the first capacitor and the second capacitor are in parallel to each other relative to the step up transformer, wherein in response to the applied stepped up voltage the first capacitor and the second capacitor store the stepped up voltage;

discharging the stepped up voltage stored in the first capacitor through an inductor placed across the first capacitor in order to reverse a polarity of the stepped up voltage stored in the first capacitor; and

applying the reversed polarity stepped up voltage on the first capacitor and the stepped up voltage on the second capacitor across electrodes of the discharge chamber, whereby a total voltage applied across the electrodes is approximately twice the stepped up voltage.

13. A method according to claim 12, further comprising:

using a solid state switch to trigger the application of the voltage from the primary storage capacitor to the step up transformer.

14. A method according to claim 12, further comprising:

transmitting the reversed polarity stepped up voltage and stepped up voltage through a compressor inductor to the electrodes.

15. A method according to claim 14, further comprising:

using a reset control circuit to provide reset current to the compressor inductor.

16. A method according to claim 12, further comprising:

using at least one compressor stage to reduce the width of a voltage pulse applied to the electrodes.

17. A system of providing an electrical pulse to drive a discharge chamber of a laser system, the method comprising:

a primary storage capacitor capable of storing a voltage;

a step-up transformer coupled to the primary storage capacitor for receiving the voltage from the primary storage capacitor and outputting a stepped up voltage;

a first capacitor and a second capacitor each coupled with the step of transformer for receiving and storing the stepped-up voltage output from the step-up transformer, the first capacitor and the second capacitor also coupled to each other in parallel relative to the step up transformer;

a magnetic compressor coupled across the first capacitor such that the stepped up voltage stored in the first capacitor can be discharged through the magnetic compressor in order to reverse a polarity of the stepped up voltage stored in the first capacitor; and

discharge electrodes in the discharge chamber capable of receiving the reversed polarity stepped up voltage on the first capacitor and the stepped up voltage on the second capacitor, the first and second capacitors being in series with each other relative to the discharge electrodes, whereby a total voltage applied across the electrodes is approximately twice the stepped up voltage.